

Long-Term Hydrologic Impact Assessment (L-THIA) - Microsoft Internet Explorer provided by Purdue University

Address: <http://www.ecn.purdue.edu/runoff/>

Local Government Environmental Assistance Network

HOT TOPICS	WHAT'S NEW?	REGULATORY INFORMATION	TOOLS & RESOURCES	CALENDAR
------------	-------------	------------------------	-------------------	----------

Land Use Impacts on Water Quality

As local land use decisionmakers, municipal and county leaders regularly measure the benefits and costs of development proposals. In addition to factors such as the extension of existing infrastructure and the delivery of government services, local officials are beginning to consider the impact that land use changes will have on a community's water quality.

Land use changes can significantly impact groundwater recharge, stormwater drainage, and water pollution. The Long-Term Hydrologic Impact Assessment (L-THIA) model was developed as an accessible online tool to assess the water quality impacts of land use change. Based on community-specific climate data, L-THIA estimates changes in recharge, runoff, and nonpoint source pollution resulting from past or proposed development. As a quick and easy-to-use approach, L-THIA's results can be used to generate community awareness of potential long-term problems and to support planning aimed at minimizing disturbance of critical areas. L-THIA is an ideal tool to assist in the evaluation of potential effects of land use change and to identify the best location of a particular land use so as to have minimum impact on a community's natural environment.

Basic L-THIA **Impervious L-THIA** **GIS L-THIA**

Differences Between the Models

- **Basic L-THIA**

SEARCH / LGEAN CITY
UPDATE SERVICE
SITE MAP
ASK LGEAN
HOME

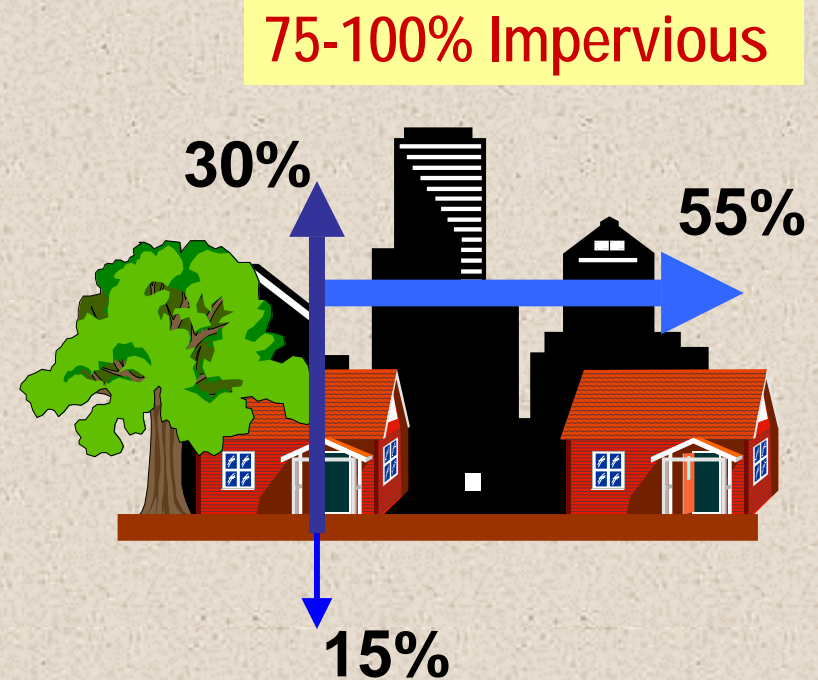
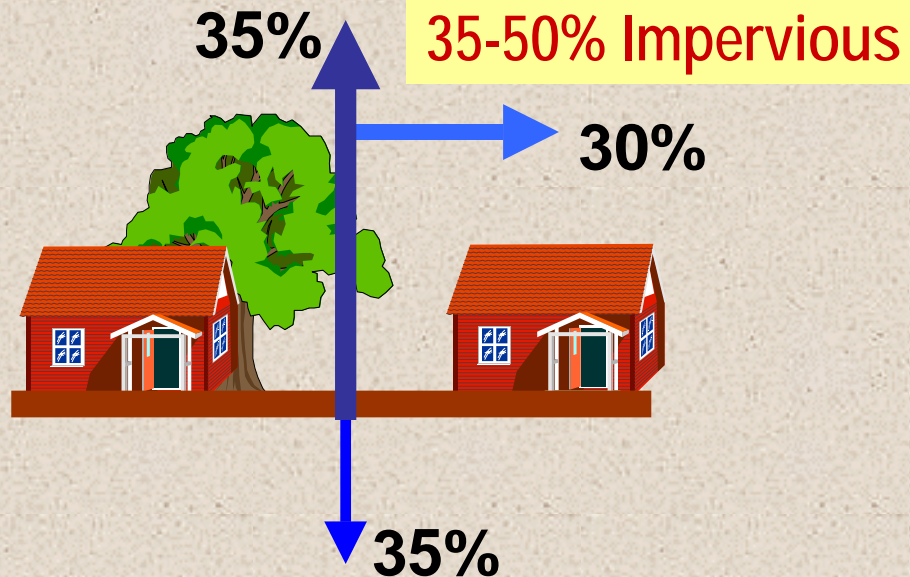
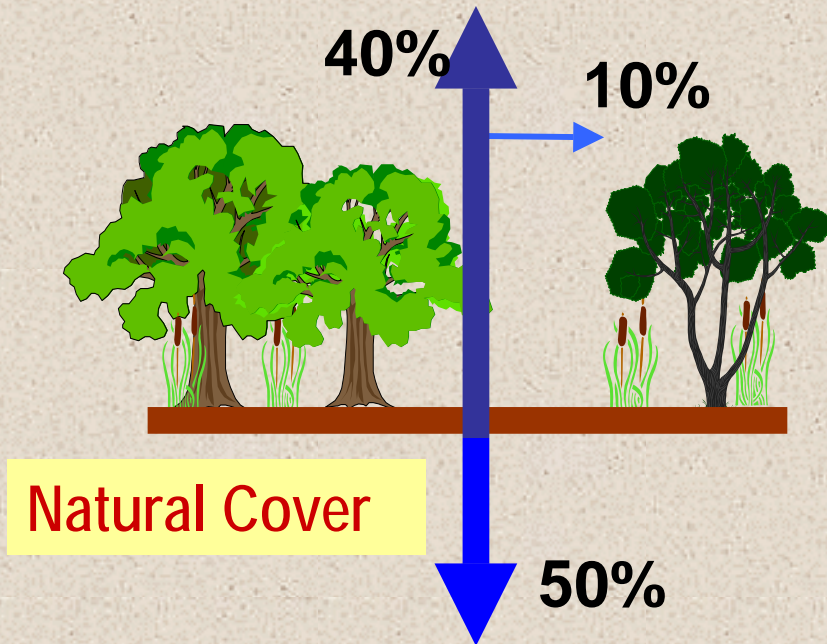
Internet

Introducing Web-Based Decision Tools for Environmental Management To Lake Michigan Communities

Rich Zdanowicz &
Alfred Krause

Long-Term Hydrological Impact Assessment (L-THIA)

Land Use Decisions Affect Runoff, Recharge, and Water Quality



**Rivers Drying Up
Rivers Flooding
Water Polluted
Stream Banks Eroding**



Stream Ecology Changing

**Wells Running Dry
Wetland Habitat Shrinking**



Rivers Drying Up Rivers Flooding Water Polluted Str

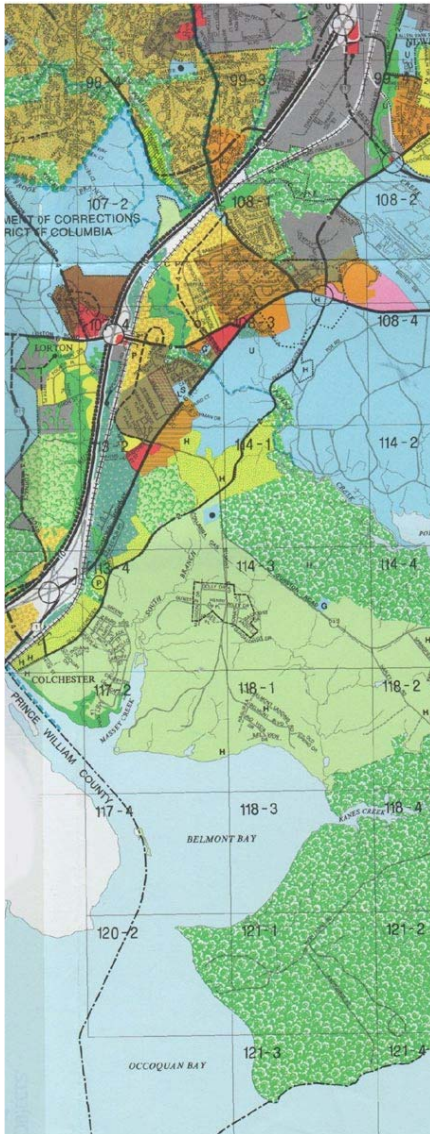


Most communities respond to this with a mix of reactive and proactive strategies, including planning

ry
inking



Planning

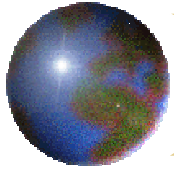


The most important, large-scale, proactive step:

Where you do it can be just as important as what you do

Multifaceted – so how do you bring environmental concerns into this?

Impact Assessment Tools



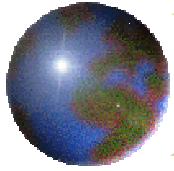
A little history....

Northeast Ohio, 1992: “Our wetlands are failing”

Local Planners: Need model to assess impact of land use change on hydrology.

Reality: Available models were data intensive and complex – and getting more so.

The Aim: To develop a user-friendly model using basic available data for land use and soils, in response to the needs of planners and local environmental groups.



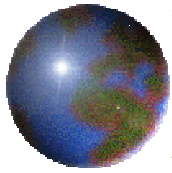
L-THIA

Based on the rainfall – land cover – runoff analysis method already used in many communities

Input: Land Use Pattern(s) + Soils Pattern

Process: Daily Runoff and Pollutant Loading Calculations (30 years)

Output: Average Annual Runoff and NPS loads for Specific Land Use Patterns



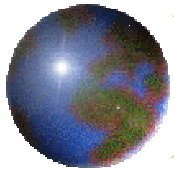
L-THIA



Originally a simple
spreadsheet program

Now a simple web
tool

GIS extension version also
available



Large-Scale Implementation

- ICMA (International City/County Management Association)

The image displays three screenshots of the LGEAN website and the L-THIA tool interface, illustrating the large-scale implementation of the Long-Term Hydrologic Impact Assessment (L-THIA) tool.

Left Screenshot: Local Government Assistance Network - LGEAN - Microsoft Internet Explorer

This screenshot shows the LGEAN homepage. The header includes the ICMA logo and the text "Local Government Environmental Assistance Network". The main content area features a large graphic with the LGEAN logo and the text "EPA Changes NSR Rules". A sidebar on the left contains navigation links: ABOUT LGEAN, LGEAN PARTNERS, ASK LGEAN, UPDATE SERVICE, SITE MAP, and SEARCH/LGEAN CITY. The footer mentions that LGEAN is managed and operated by the International City/County Management Association (ICMA) and provides contact information: lgean@icma.org or call 877-865-4326. A "Geotrust True Site International" logo is also present.

Middle Screenshot: Long-Term Hydrologic Impact Assessment (L-THIA) - Microsoft Internet Explorer provided by Purdue University

This screenshot shows the L-THIA homepage. The header includes the text "Long-Term Hydrologic Impact Assessment (L-THIA) - Microsoft Internet Explorer provided by Purdue University". The main content area features a large graphic with the L-THIA logo and the text "Land Use Impacts on Water Quality". A sidebar on the left contains navigation links: SEARCH/LGEAN CITY, UPDATE SERVICE, SITE MAP, ASK LGEAN, and HOME. The footer includes links for "Background Information", "FAQ", and "Comments or Question".

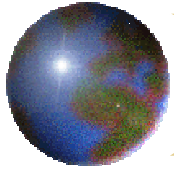
Right Screenshot: L-THIA Basic Model - Microsoft Internet Explorer provided by Purdue University

This screenshot shows the L-THIA Basic Model interface. The header includes the text "L-THIA Basic Model". The main content area features a large graphic with the L-THIA logo and the text "Land Use Change Scenarios". A sidebar on the left contains navigation links: SEARCH/LGEAN CITY, UPDATE SERVICE, SITE MAP, ASK LGEAN, and HOME. The footer includes links for "Background Information", "FAQ", and "Comments or Question".

The L-THIA Basic Model interface includes a "Step Three" section titled "Land Use Change Scenarios". It provides instructions for users to identify the current land use for a specific area and describe up to two land use change scenarios. Users can select many land use descriptions as necessary to describe the current land use or land use change scenarios. Users must also describe each land use description's size and soil type. Size can be entered in either acres, square miles, hectares, or square kilometers. If unknown, soil types can be determined using the link below to search GIS maps of your region. Help is available by clicking on any of the question mark icons. (Important: The total area of the current land use and each of the land use change scenarios must be equal before L-THIA can run).

The interface includes a form for entering land use data. The form has columns for Land Use, Soil Type, Area, and Scenario. The "Area" column is currently set to "ACRES". A "View Completed Sample" button is available. The "Total Area" is displayed as 0.

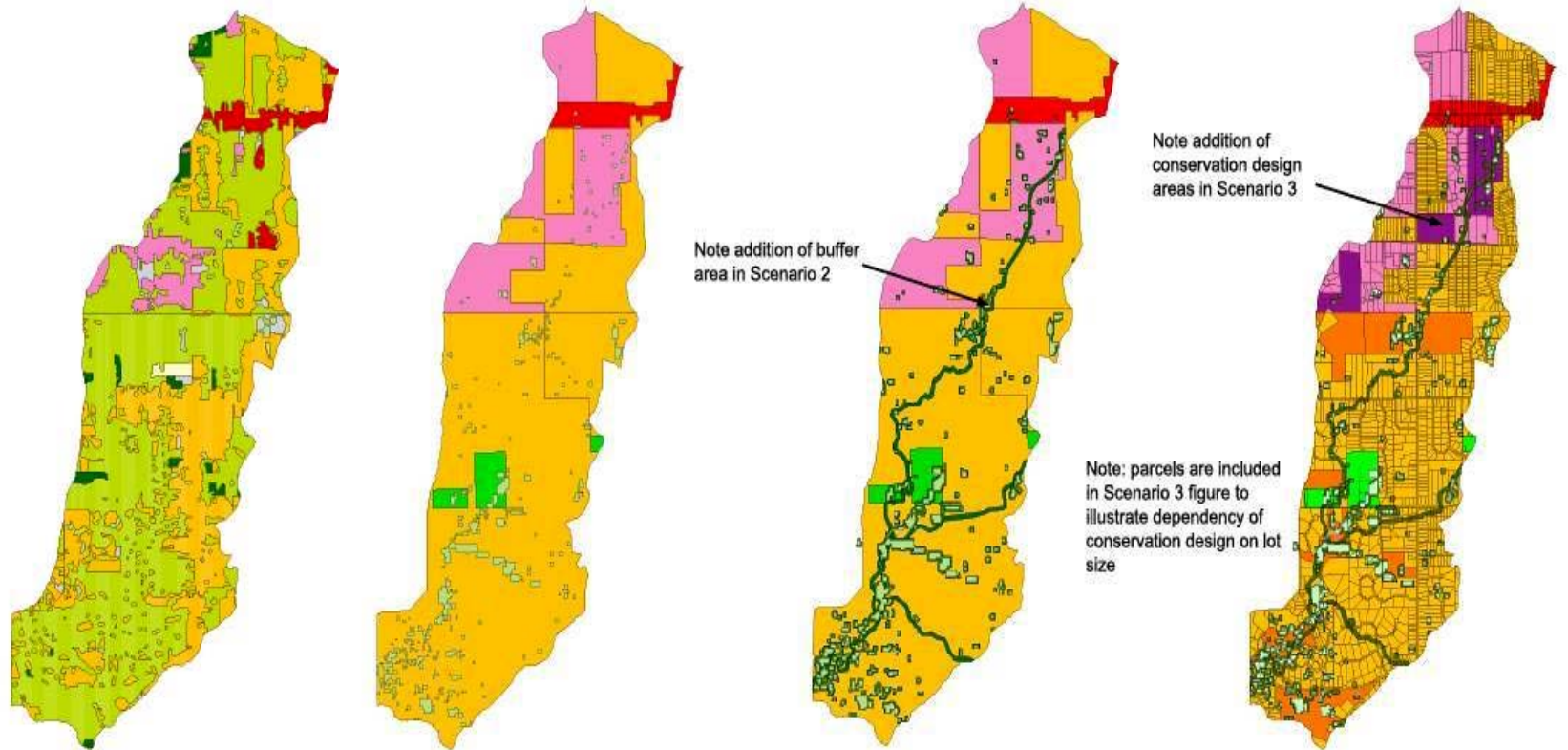
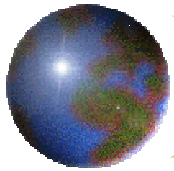
The interface also includes a "Check Map" button and a "L-THIA Home" button.



Example Applications of L-THIA

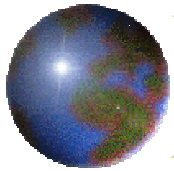
Impacts Assessment for:

- proposed land use change and wetland hydrology.
- residents downstream of a proposed land use change.
- tourism / agriculture transition impacts on a coastal watershed, Barbados.
- past and future land use change in an urban-rural fringe watershed, including impact fee assessment.
- Watershed scale implications of land use change for NPS pollution

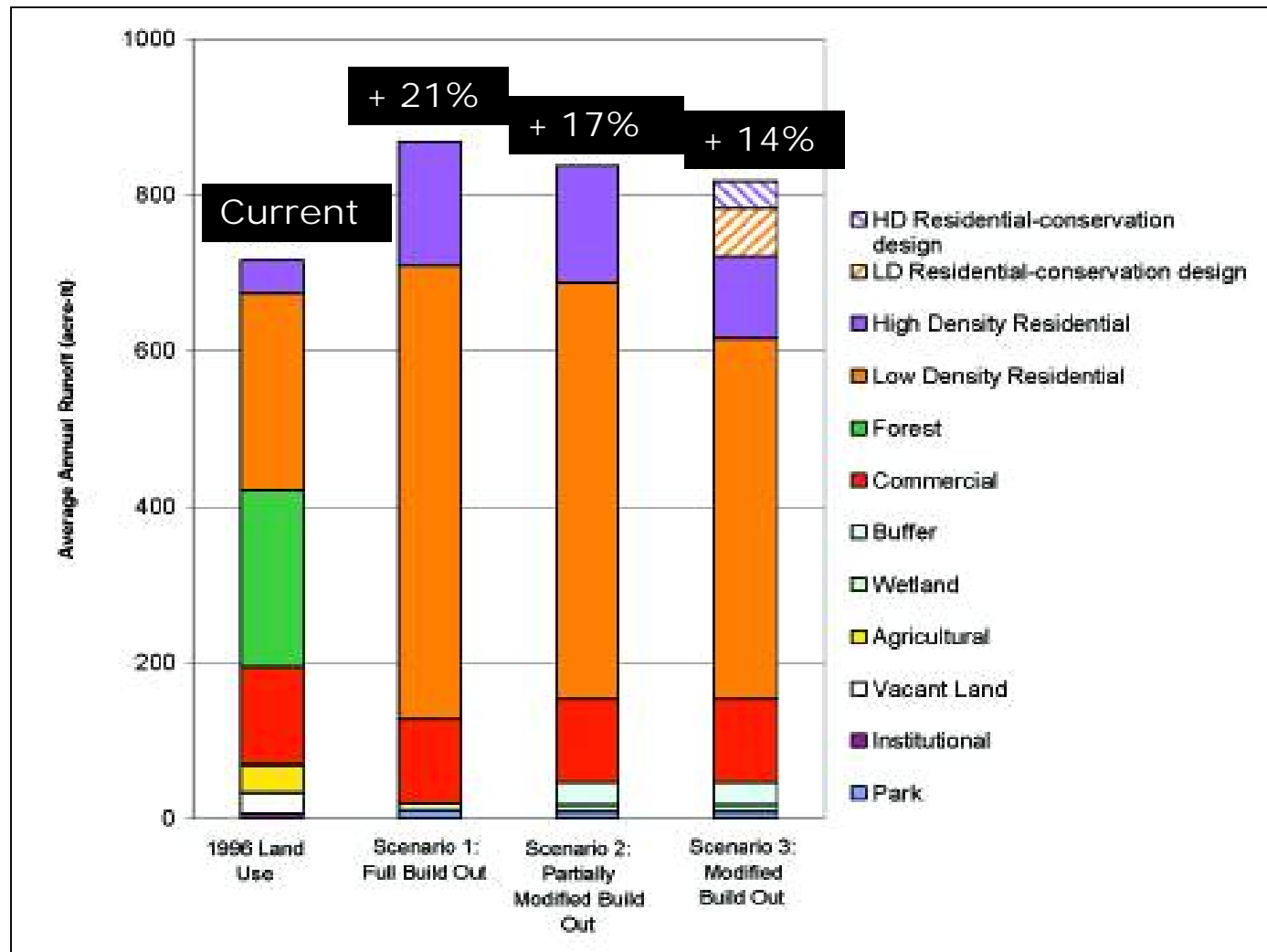


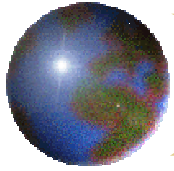
Example: Chagrin River
Watershed Partners,
Griswold Creek Watershed

Land Use	
	Agriculture
	Forest
	Wetland
	Industrial
	Wetland/Riparian Buffer
	Commercial
	Institutional
	High Density Residential
	Low Density Residential
	HD Residential-conservation design
	LD Residential-conservation design
	Vacant land



*Proposed approaches would reduce
but not eliminate the impact*





So how do you do it?

- L-THIA Web

Long-Term Hydrologic Impact Assessment (L-THIA) - Microsoft Internet Explorer provided by Purdue University

Address: <http://www.ecn.purdue.edu/runoff/>

Local Government Environmental Assistance Network

HOT TOPICS | WHAT'S NEW? | REGULATORY INFORMATION | TOOLS & RESOURCES | CALENDAR

Land Use Impacts on Water Quality

As local land use decisionmakers, municipal and county leaders regularly measure the benefits and costs of development proposals. In addition to factors such as the extension of existing infrastructure and the delivery of government services, local officials are beginning to consider the impact that land use changes will have on a community's water quality.

Land use changes can significantly impact groundwater recharge, stormwater drainage, and water pollution. The Long-Term Hydrologic Impact Assessment (L-THIA) model was developed as an accessible online tool to assess the water quality impacts of land use change. Based on community-specific climate data, L-THIA estimates changes in recharge, runoff, and nonpoint source pollution resulting from past or proposed development. As a quick and easy-to-use approach, L-THIA's results can be used to generate community awareness of potential long-term problems and to support planning aimed at minimizing disturbance of critical areas. L-THIA is an ideal tool to assist in the evaluation of potential effects of land use change and to identify the best location of a particular land use so as to have minimum impact on a community's natural environment.

Basic L-THIA | **Impervious L-THIA** | **GIS L-THIA**

Differences Between the Models

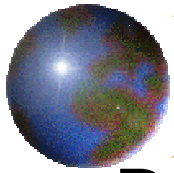
- [GIS L-THIA](#)
Enables users to download an ArcView GIS version of L-THIA for PCs.
- [Related Tools](#)
Other tools from the developers of L-THIA

[Background Information](#)

[FAQ](#)

[Comments or Question](#)

<http://www.ecn.purdue.edu/runoff/lthianew>



Run L-THIA from Text Input form

State

County

Land use and hydrologic soil group selection

Click Next

Area input

Land Use	Soil Type	Current	Scenario 1	Scenario 2
Commercial	B	10	80	
Industrial	B	20	70	
High Density Residential	C			
Low Density Residential	B			
Grass/Pasture	C			
Agricultural	C	180	50	
Forest	B	200	90	
SELECT LAND USE	A			
SELECT LAND USE	A			
Total Area:		590	590	0

Tables and charts for interpretation

LGEAN - Microsoft Internet Explorer provided by Purdue University



L-THIA Basic Model

Introduction Location Land Use Change Results Interpreting the Results

Step Four

Runoff and Nonpoint Source Pollutant Results

Based on the information provided (see Summary of Scenarios), L-THIA estimates the following rates of runoff volume, runoff depth, and nonpoint source pollutants. Results can also be viewed in comparative bar graphs and pie charts by using the pull-down menus located at the top-left of each table.

Go to:

Runoff Volume

Print Results

Download Results

SUMMARY OF SCENARIOS

State: Michigan
County: Muskegon

View as: Select

Land Use	Hydrologic Soil Group	Current	Scenario 1	Scenario 2
Commercial	B	10	80	0
Industrial	B	20	70	0
High Density Residential	C	10	50	0
Low Density Residential	B	20	100	0
Grass/Pasture	C	150	150	0
Agricultural	C	180	50	0
Forest	B	200	90	0

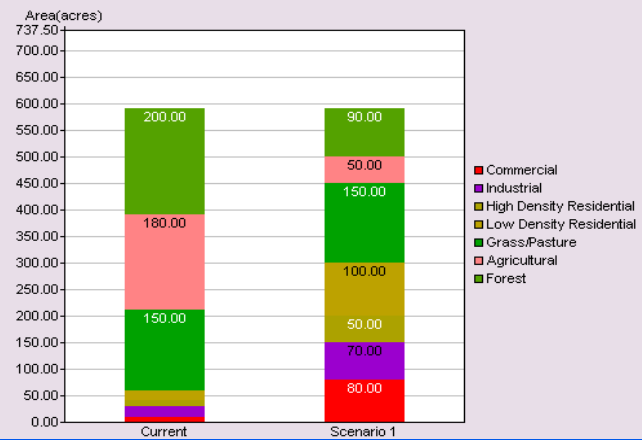
RUNOFF RESULTS ?

Avg. Annual Runoff Volume (acre-ft)

View as: Select

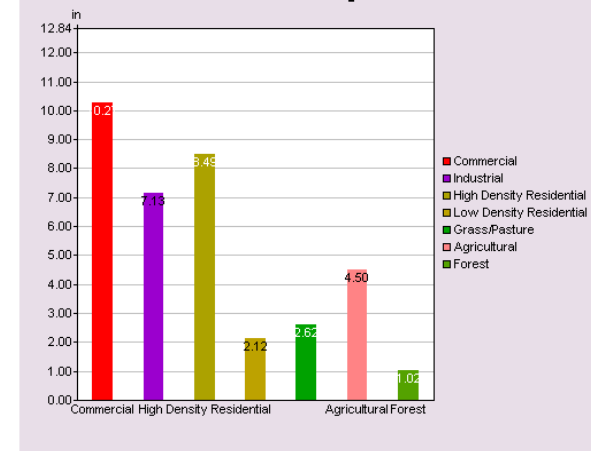
Land Use	Current	Scenario 1	Scenario 2
Commercial	8.52	68.19	0
Industrial	11.83	41.42	0
High Density Residential	7.04	35.23	0
Low Density Residential	3.51	17.59	0
Grass/Pasture	32.61	32.61	0
Agricultural	67.23	18.67	0
Forest	16.93	7.61	0

Land Use Area



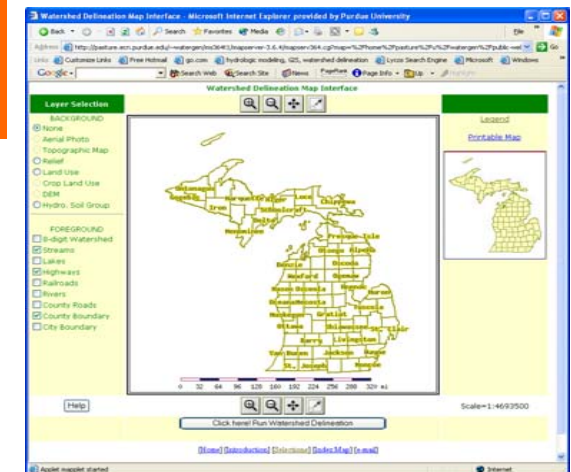
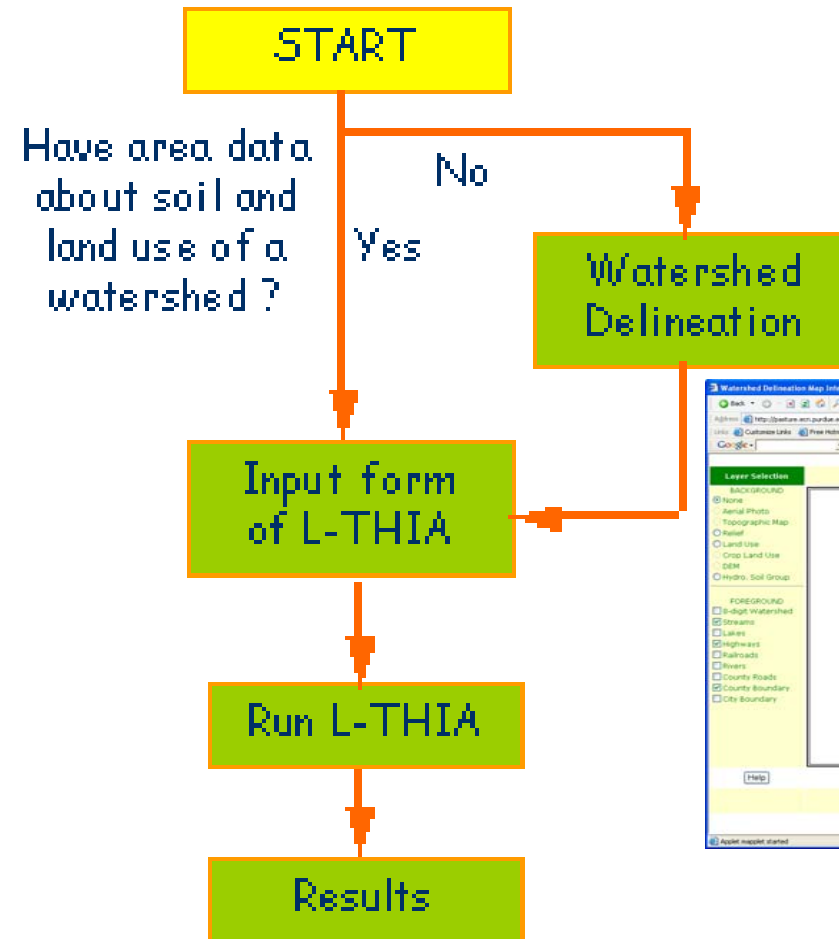
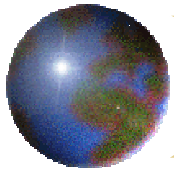
Untitled Document - Microsoft Internet Explorer provided by Purdue University

Runoff Depth

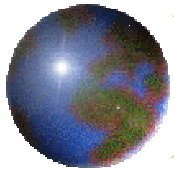


Close

Print Results



What if I don't have Land Use and Soils Data?



Web - Microsoft Internet Explorer provided by Purdue University

Address: <http://pasture.ecn.purdue.edu/~watergen/>

Click Here

HYMAPS-OWL

Online Watershed Delineation: Web-GIS tools for Spatial Hydrologic Analysis

L-THIA
Long-Term Hydrologic Impact Assessment

ICMA
International City/County Management Association
LGEAN: L-THIA

Short-term Runoff Tools
Sediment and Erosion Control Planning, Design and Specification Information

Wellhead Protection Area
Web-based Wellhead Protection Area Defining Tool

WWW-NAPRA
Web-based National Agricultural Pesticide Risk Analysis

CAAGIS
Center for Advanced Applications in GIS, Ag. and Bio. Engineering, Purdue University

Urban BMPs
Web-based Preliminary Tool for Total Maximum Daily Loading

PURDUE UNIVERSITY
AGRICULTURAL AND BIOLOGICAL ENGINEERING

For more information, please Contact Bernard A. Engel and Jin-Yong Choi

Web-GIS - Online Watershed Delineation - Online Digitizing

For online watershed delineation, hydrologic data preparation and online digitizing, enter land use in the location you select.

Click Here

For online digitizing and hydrologic data extraction for digitized area. You can use and hydrologic soil group information for any area you draw using online digitizing applet in Indiana, USA, in real time within your WWW browser.

Click Here

Fort Bragg (MapServer interface), Hoke and Cumberland County, North Carolina includes aerial photographs, land use, DEM and other geographical information.

Once you have obtained a watershed using watershed delineator and online digitizing tool you can:

- * Estimation of impervious area of your watershed
- * Run L-THIA (Long-Term Hydrologic Impact Assessment) model for runoff and source pollution loading
- * Run SedSpec (Sediment and Erosion Control Planning, Design and Specification Information and Guidance Tool)
- * After processing, you can also download the watershed boundary, land use and hydrologic soil group maps onto your computer, and use with desktop GIS tools ArcView. (Refer to the download page)

Programmed by Jin-Yong Choi & Bernard A. Engel, and data supported by Larry Theller, CAAGIS (Center for Advanced Application of GIS)
Agricultural & Biological Engineering Department, Purdue University
ABE Bldg. 225 S. University Street, West Lafayette, IN 47907-2064
This tools have been developed with support from USEPA, USDA and US Army

[Home][Introduction][Selections][e-mail]

Select your state - Microsoft Internet Explorer provided by Purdue University

Address: http://pasture.ecn.purdue.edu/~watergen/owls/htmls/select_your_state.htm

Select your state

Indiana

Illinois : This is a trial version.

Ohio : This is a trial version.

Wisconsin : This is a trial version.

Michigan : This is a trial version.

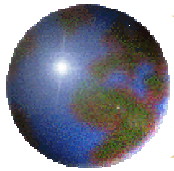
Minnesota is under processing and will be added.

Programmed by Bernard A. Engel and Jin-Yong Choi.

Data processed and prepared by Larry Theller in CAAGIS (Center for Advanced Applications of GIS)

PURDUE UNIVERSITY
AGRICULTURAL AND BIOLOGICAL ENGINEERING

<http://pasture.ecn.purdue.edu/~watergen>



Layer
Control
On/Off

Display Control
Zoom in/out
Pan, Full extent

Map Display

Reference Map

WD Submit Button

Watershed Delineation Map Interface - Microsoft Internet Explorer provided by Purdue University

Address: <http://pasture.ecn.purdue.edu/~watergen/ms364t1/mapserver-3.6.4/mapserv364.cgi?map=%2Fhome%2Fpasture%2Fu%2Fwatergen%2Fpublic-wel>

Links: Customize Links, Free Hotmail, go.com, hydrologic modeling, GIS, watershed delineation, Lycos Search Engine, Microsoft, Windows

Google Search Web Search Site News PageRank Page Info Up Highlight

Watershed Delineation Map Interface

Layer Selection

BACKGROUND

- ☒ None
- ☐ Aerial Photo
- ☐ Topographic Map
- ☐ Relief
- ☐ Land Use
- ☐ Crop Land Use
- ☐ DEM
- ☐ Hydro. Soil Group

FOREGROUND

- ☐ 8-digit Watershed
- ☒ Streams
- ☐ Lakes
- ☒ Highways
- ☐ Railroads
- ☐ Rivers
- ☐ County Roads
- ☒ County Boundary
- ☐ City Boundary

Legend

[Printable Map](#)

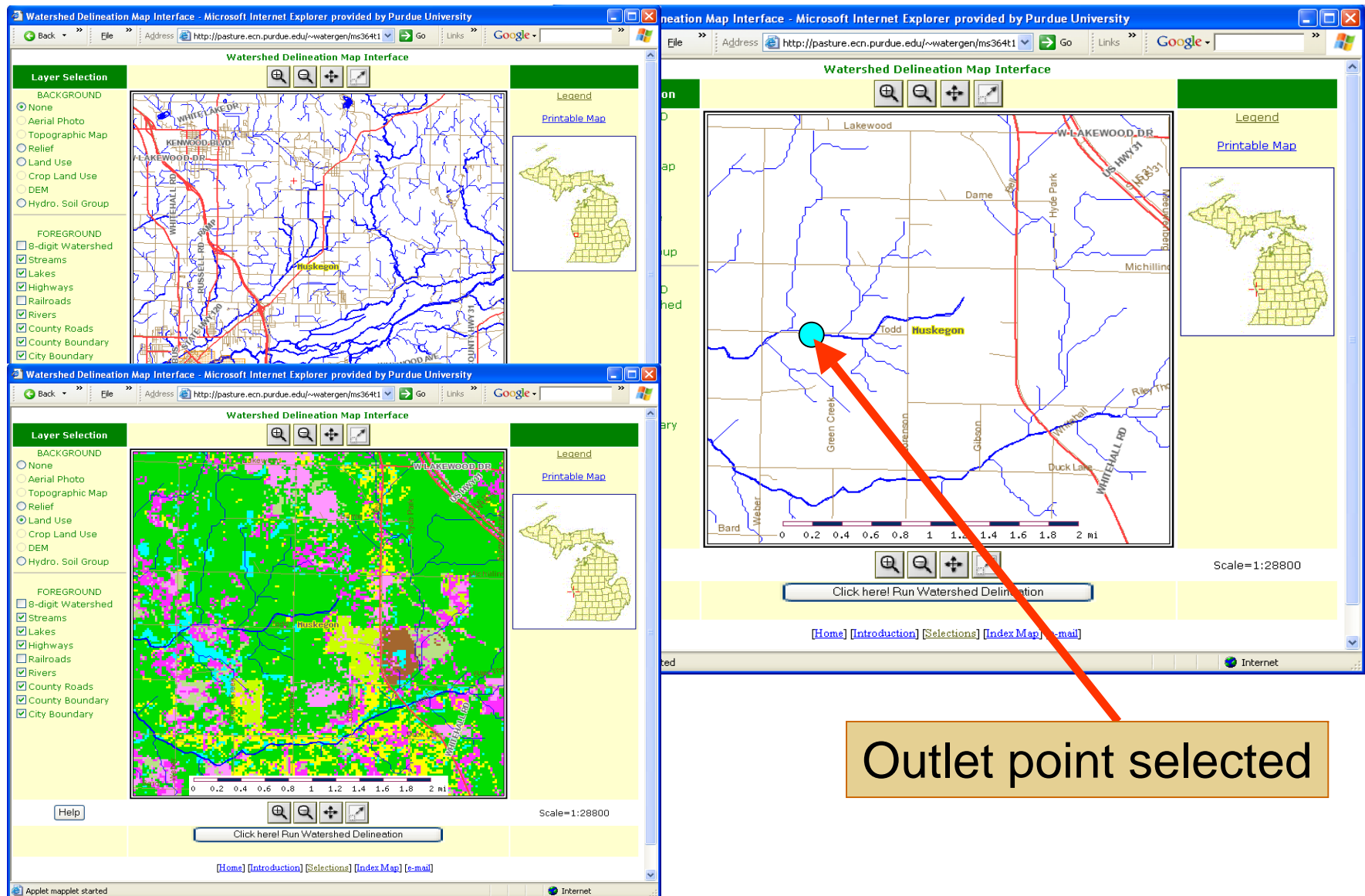
Scale=1:4693500

Click here! Run Watershed Delineation

[\[Home\]](#) [\[Introduction\]](#) [\[Selections\]](#) [\[Index Map\]](#) [\[e-mail\]](#)

Applet maplet started

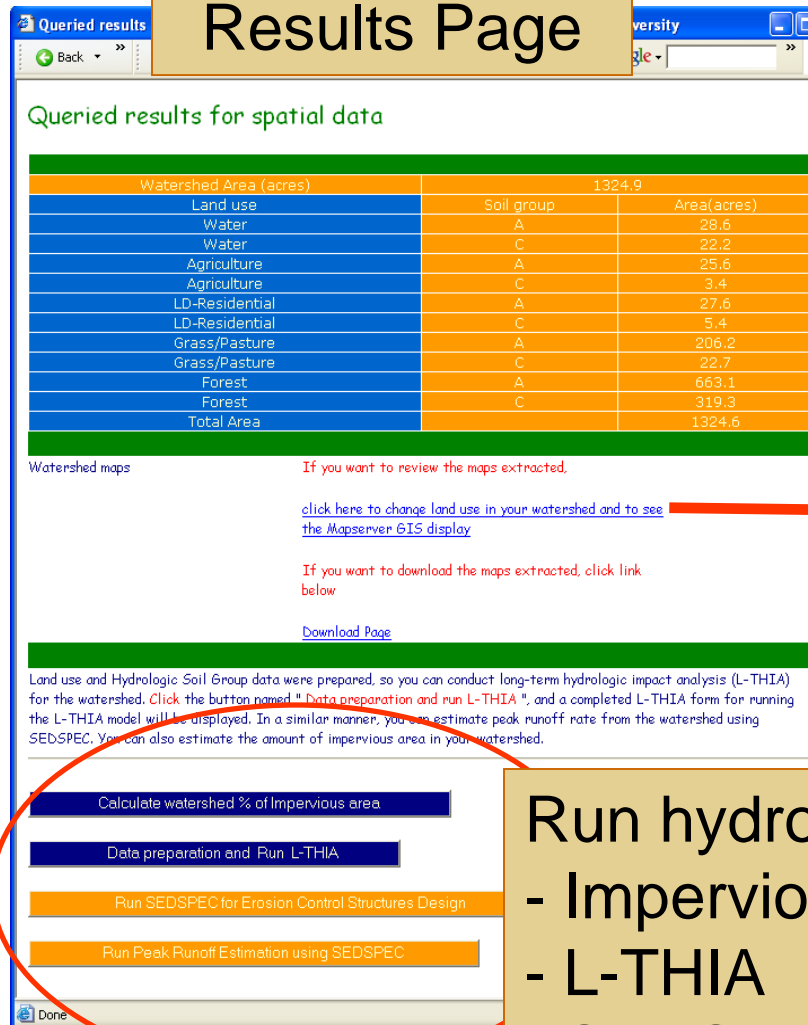
Watershed Delineation: Muskegon County, MI



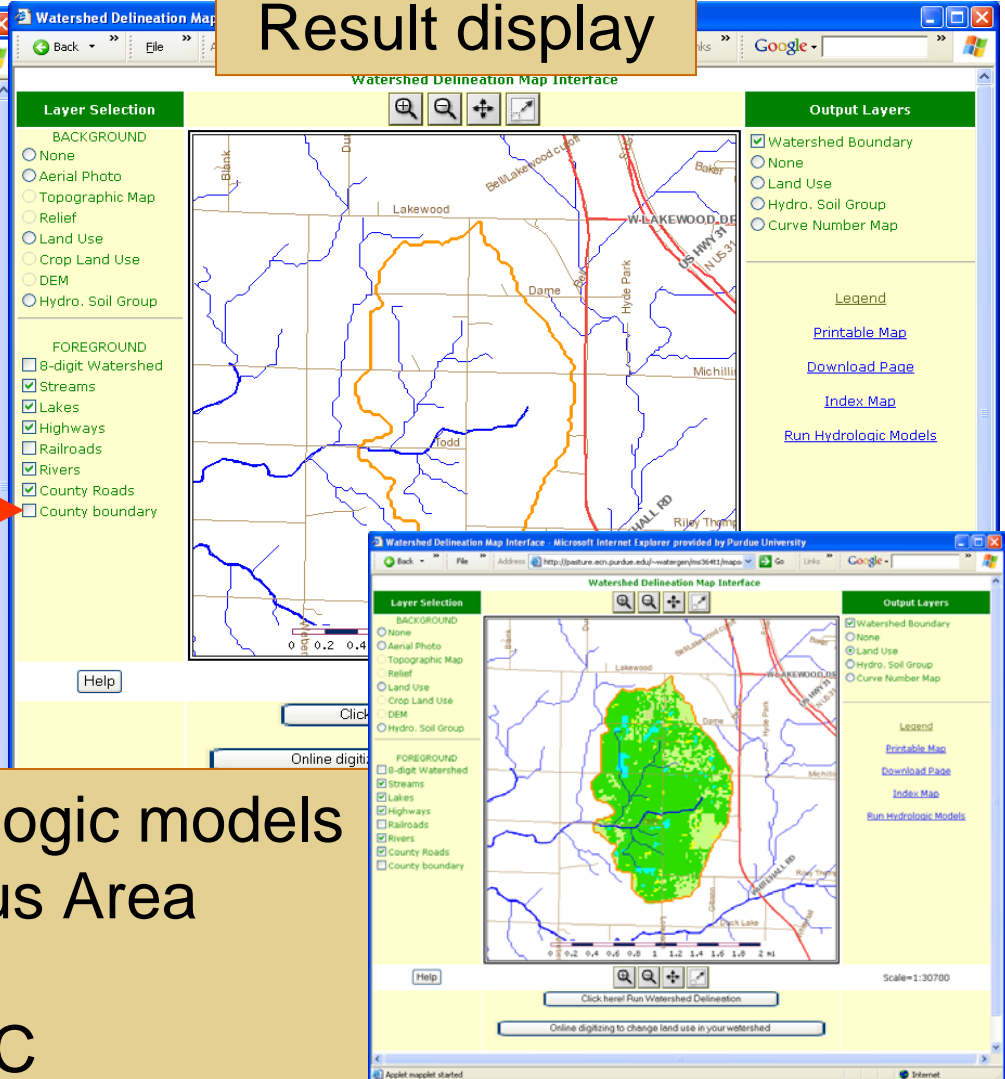
Outlet point selected

Watershed Delineation: Muskegon County, MI

Results Page



Result display



Run L-THIA : Muskegon County, MI

Queried results for spatial data

Watershed Area (acres)	
Land use	Soil group
Water	A
Water	C
Agriculture	A
Agriculture	C
LD-Residential	A
LD-Residential	C
Grass/Pasture	A
Grass/Pasture	C
Forest	A
Forest	C
Total Area	

Watershed maps

If you want to review the maps extracted from the Mapserver GIS display

[click here to change land use in your watershed](#)

If you want to download the maps extracted below

[Download Page](#)

Land use and Hydrologic Soil Group data were prepared, so you can conduct long-term simulations for the watershed. Click the button named "Data preparation and run L-THIA", and the L-THIA model will be displayed. In a similar manner, you can estimate peak runoff using SEDSPEC. You can also estimate the amount of impervious area in your watershed.

Calculate watershed % of Impervious area

Data preparation and Run L-THIA

Run SEDSPEC for Erosion Control Structures Design

Run Peak Runoff Estimation using SEDSPEC

L-THIA Basic Input

- Name to identify output: wdcjy1285
- State: Michigan
- County: Muskegon
- Area in: acres

LAND USE	HYD. SOIL GROUP	1	2	3
Water/Wetlands	A	28.6		
Water/Wetlands	C	22.2		
Agricultural	A	25.6		
Agricultural	C	3.4		
Low Density Residential	A	27.6		
Low Density Residential	C	5.4		
Grass/Pasture	A	206.2		
Grass/Pasture	C	22.7		
Forest	A	663.1		
Forest	C	319.3		
SELECT LANDUSE	A			
SELECT LANDUSE	A			

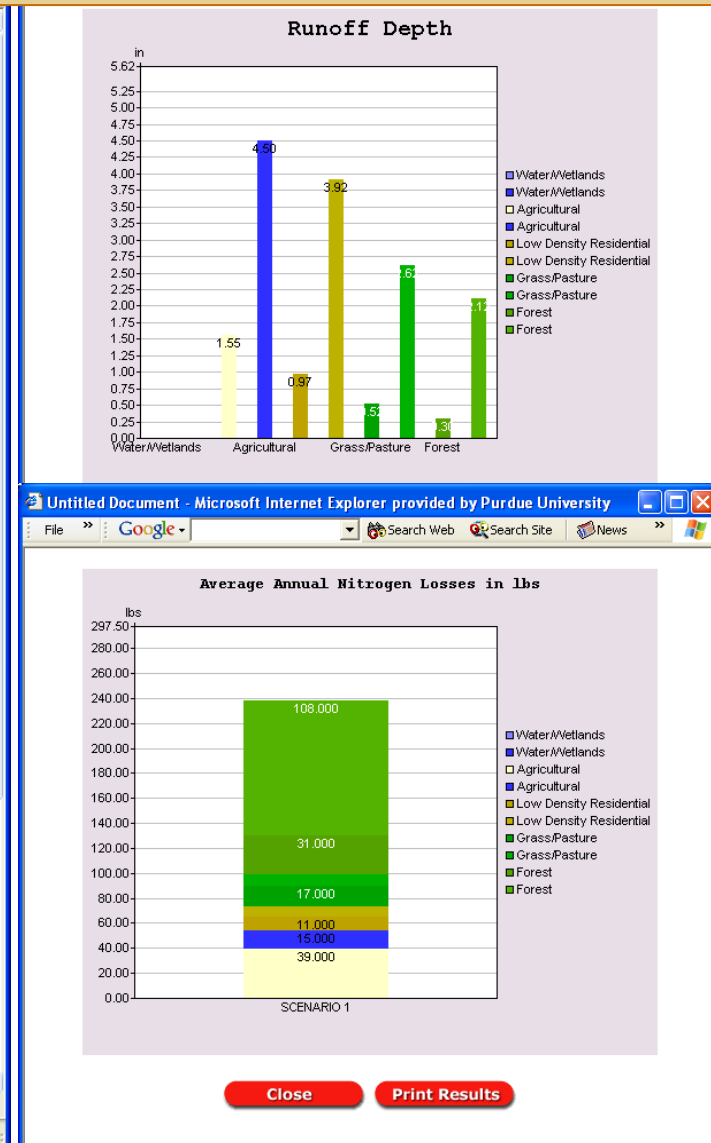
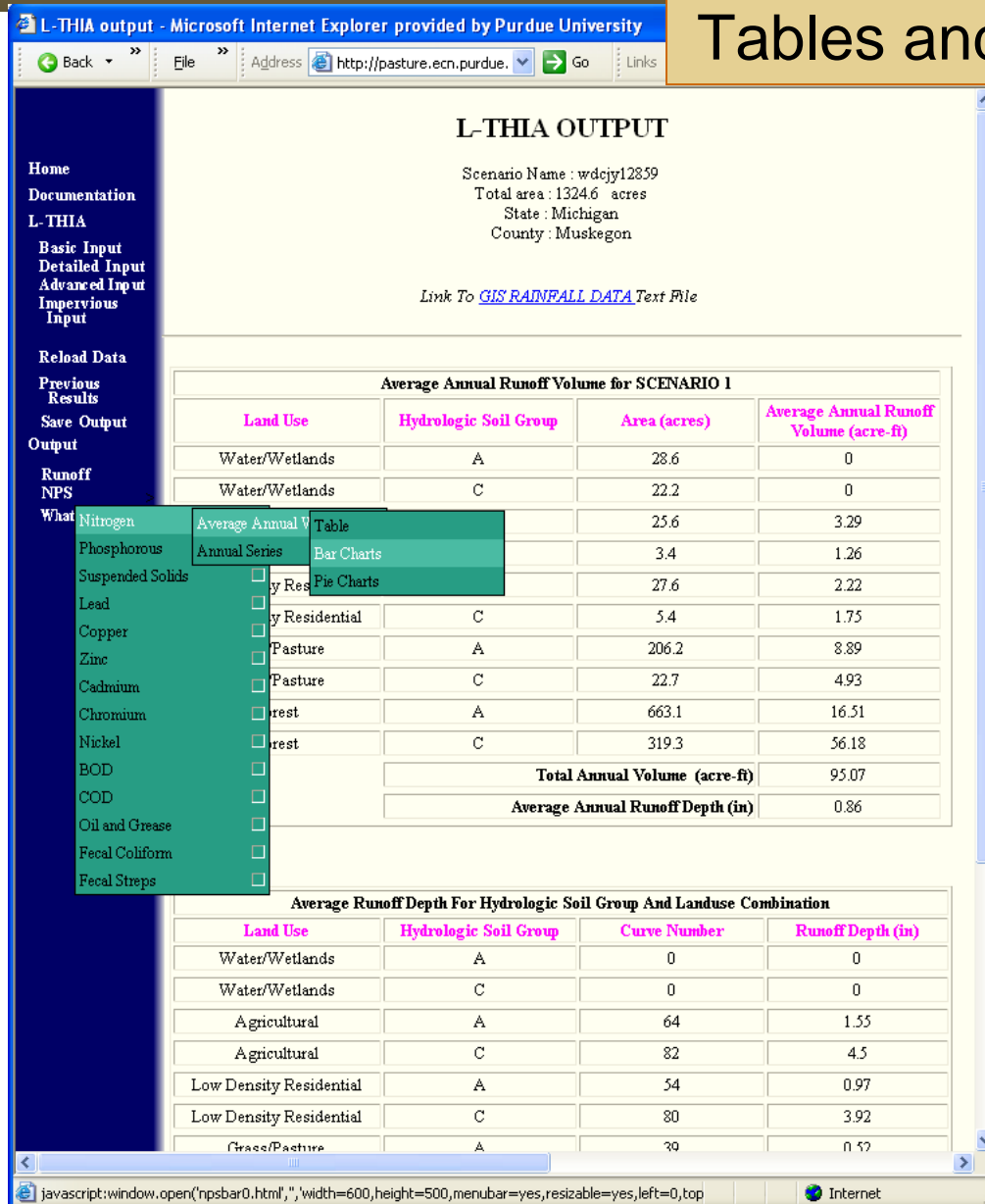
RUN L-THIA

[Back to Watershed Delineation](#)

Data Preparation and Run L-THIA

Run L-THIA : Muskegon County, MI

Tables and charts for interpretation



On-line Digitizing Tool: Indian Creek, Tippecanoe County, Indiana

Land Use Change Using On-line Digitizing Tool and Run L-THIA

The screenshot displays the L-THIA web application interface. On the left, the 'Online Web-GIS Digitizing Tool' is shown, featuring a map of Tippecanoe County, Indiana, with various land use polygons digitized in different colors. A legend identifies features like Highways, Roads, Flowpath(stream), County, Lakes, Stream, and Watershed boundary. A summary window lists the digitized areas:

Serial No.	Area sq. km	Land Use	Color
1	0.045852239462399115	Commercial	Red
2	0.0620214976511988	High Density Residential	Orange
3	0.18364500541439643	Low Density Residential	Yellow
4	0.10557227335679796	Industrial	Brown

On the right, the 'Queried results for spatial data' are displayed, showing land use data before and after digitizing, and land use data inside and outside the watershed after digitizing. The data is presented in tables with columns for Land use, Soil group, and Area (acres).

Land use data before digitizing

Land use	Soil group	Area(acres)
Agriculture	B	140
Agriculture	C	179.3
Grass/Pasture	B	5.1
Grass/Pasture	C	5.4
Forest	B	0.9
Forest	C	0.2
Total Area		330.9

Land use data inside the watershed after digitizing

Land use	Soil group	Area(acres)
Commercial	B	12.1
Agriculture	B	139
Agriculture	C	118.3
HD-Residential	C	17.2
LD-Residential	C	24.9
Grass/Pasture	B	3.7
Grass/Pasture	C	1.7
Forest	B	0.7
Forest	C	0.2
Industrial	C	12.8
Total Area		330.9

Land use data outside the watershed after digitizing

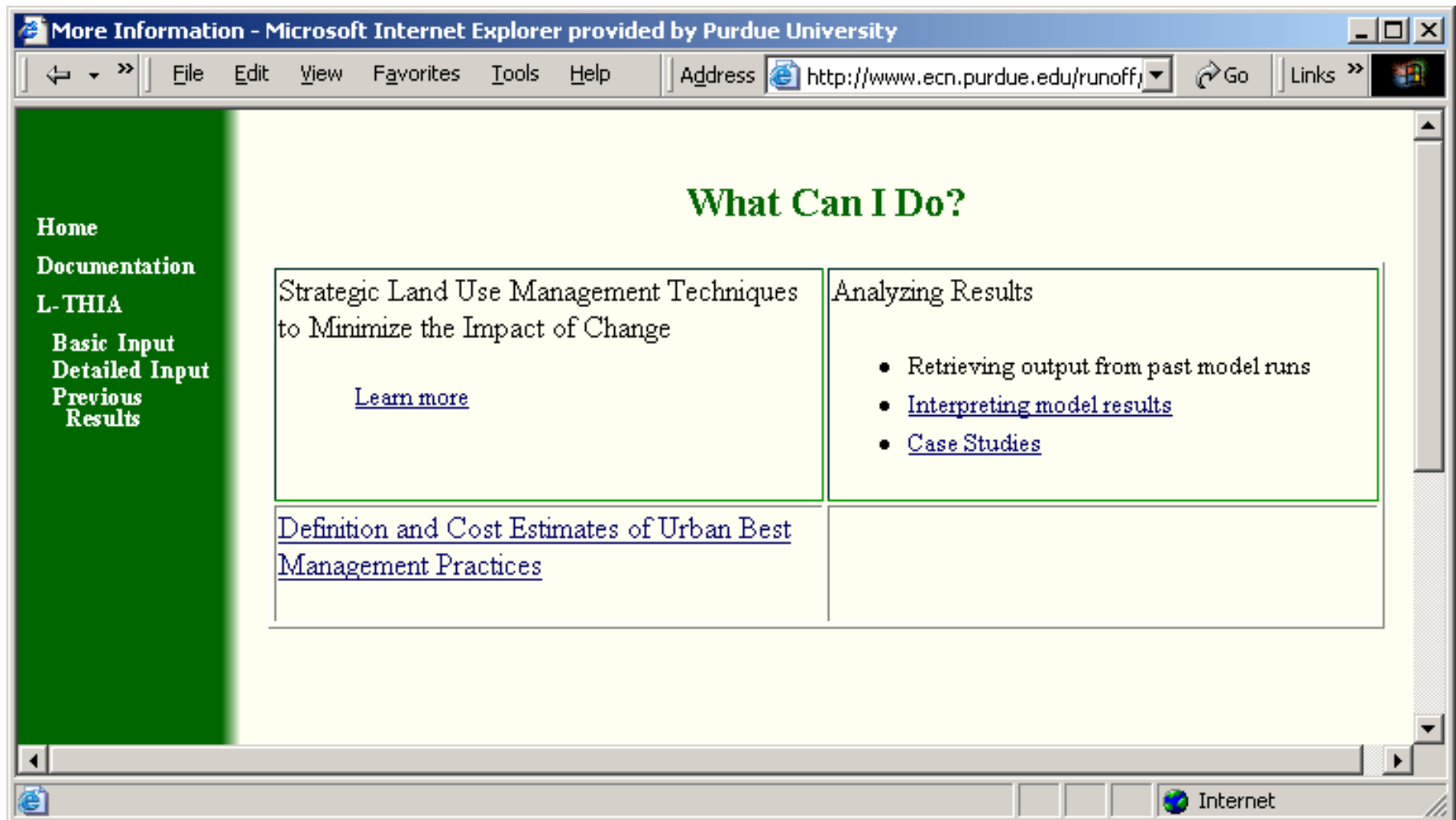
Land use	Soil group	Area(acres)
HD-Residential	C	5.1
LD-Residential	C	25.9
Industrial	C	18
Total Area		49.1

Below the tables, there are buttons for 'Calculate watershed % of Impervious area' and 'Data preparation and Run L-THIA'. A large text box at the bottom right reads 'Land Use Change Report after Digitizing'.

Land Use Change Using On-line Digitizing Tool

Run L-THIA : Muskegon County, MI

But What do the Numbers Mean?





L-THIA Advanced Input

How To use this page

- Name to identify output:
- State :
- County :
- Area in:

[\(View Maps\)](#)

LAND USE	SCENARIO 1	Soil	SELECT Land use Similar to the Custom Land use	Modify EMC Values if Desired			
	Area			Nitrogen	Phosphoro	Susp Solid	Lead
Industrial	8	A	SELECT LANDUSE	1.26	0.28	60.5	0.015
SELECT LANDUSE		A	SELECT LANDUSE				
SELECT LANDUSE		A	SELECT LANDUSE				
SELECT LANDUSE		A	SELECT LANDUSE				
SELECT LANDUSE		A	SELECT LANDUSE				
SELECT LANDUSE		A	SELECT LANDUSE				




SEDSPEC

<http://pasture.ecn.purdue.edu/~sedspec>

Short-term Runoff Tools - Microsoft Internet Explorer provided by Purdue University

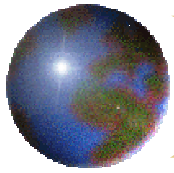
Address <http://danpatch.ecn.purdue.edu/~sedspec/> Go Links Google

Short-term Runoff Tools



- **SedSpec**
SedSpec is an expert system that will assist you in analyzing runoff and erosion problems on your site by determining the peak rate of runoff from the area. The analysis will provide information about different types of runoff and erosion control structures.
- **Rational Method**
The Rational Method is a simple method of predicting the peak rate of runoff. It is an oversimplification of the complicated runoff process, but it is considered accurate enough for runoff estimation in the design of relatively inexpensive structures where the consequences of failure are limited (i.e., failure will not result in loss of life). This tool returns the peak rate of runoff, the depth of runoff (computed using the SCS CN method), the computed time of concentration (using the Kirplich formula), and the corresponding rainfall depth.
- **TR-55**
Technical Release 55 (TR-55) presents simplified procedures for estimating runoff and peak discharges in small watersheds. While this TR gives special emphasis to urban and urbanizing watersheds, the procedures apply to any small watershed in which certain limitations are met. This tool will return the peak rate of runoff, the depth of runoff (computed using the SCS CN method).
- **Database Frontend**
Here you can retrieve rainfall depths from the databases used by SedSpec. You can choose between Technical Paper 40

Done Internet



Input for Area, HSG, and Land use

**Design Runoff Rate Calculation
(Rational Method)**

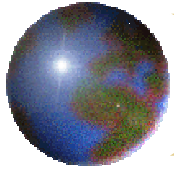
Select the units of area: acres

Area	Hydrological Soil Group State Soil Map	Land Use	Level of Use
<input type="text" value="40"/>	B	Grass/Forest Combination	Heavy
<input type="text"/>	A	Forest	Heavy
<input type="text"/>	A	Forest	Heavy
<input type="text"/>	A	Forest	Heavy
<input type="text"/>	A	Forest	Heavy

☐ Check if you have more hydrological areas in your watershed.

☐ Check if you would like to provide your own rainfall depth (Leave unchecked if you would rather use data from TP-40).

Continue[Comments](#)[Glossary](#)

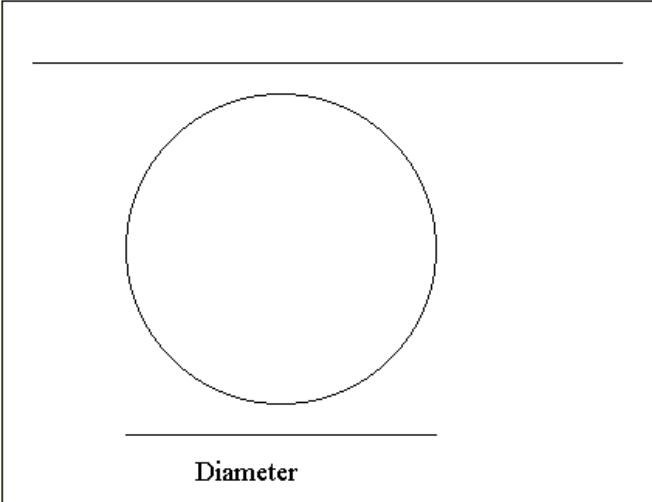


This is how a culvert design is presented. The applet provides the user the opportunity to change the number of culverts. Cost and size change accordingly.

Culvert Dimensions

Your site requires 1 culverts of the diameter given below.

Culvert diameter: inches
Number of Culverts:

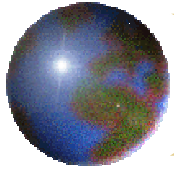


Diameter

To solve your erosion problem, you need culvert(s) of the above size. If you would like to see the difference more culverts would make on the size, select a different number from the drop down menu above.

Do not build anything on the above drawing. It is only an approximation. Contact a qualified engineer for detailed drawings and specifications.

[Return to Possible Engineering Practices](#)

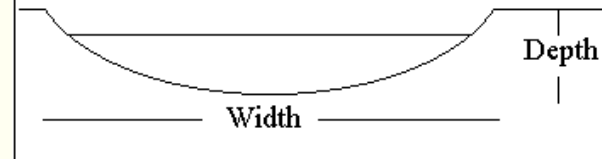


*Buttons allow
the user to
change
dimensions.*

Grass Lined Channel Dimensions

Channel width	<input type="text" value="18"/>	feet
Channel depth	<input type="text" value="2"/>	feet
Increase Width	Increase Depth	
Decrease Width	Decrease Depth	

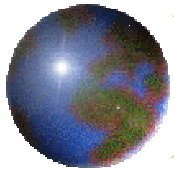
These are design widths and depths.



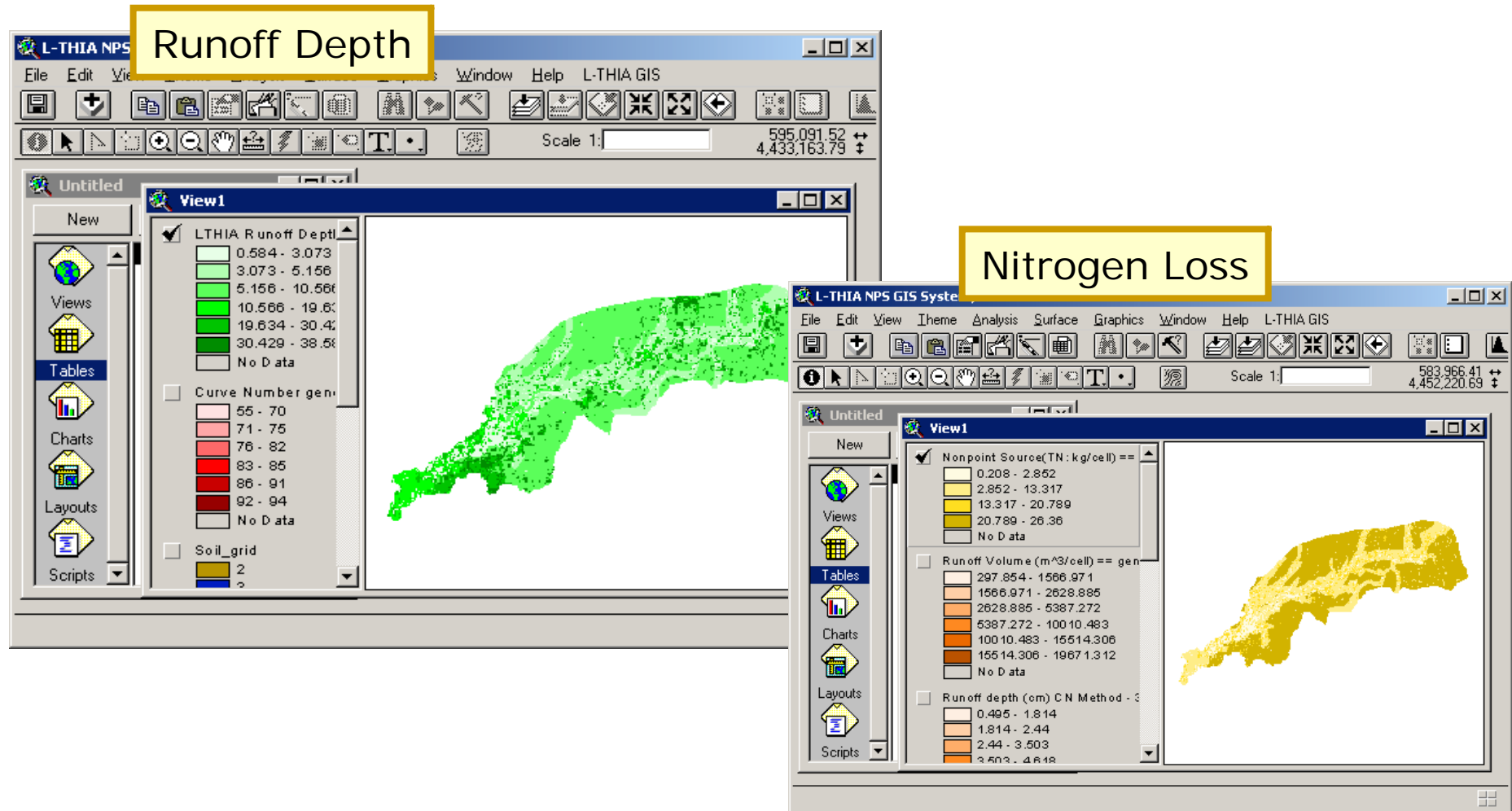
Construction of a grass lined channel similar in size to the one above will help solve your erosion problem. The drawing above is based on information pertaining to your site. The dimensions were calculated from rainfall and topographical information of the site. This drawing should give you a rough idea on how large a grass lined channel you will need.

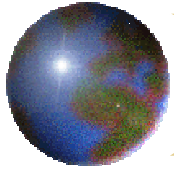
Do not build anything based on the drawing. You need to contact a local contractor or engineering firm to get construction quality blueprints.

[Return to Possible Engineering Practices](#)



L-THIA GIS Predicted Results





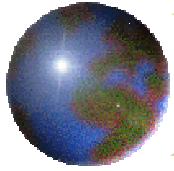
Important Questions

(we know they are important because.....)

Cost: There is no software or site access cost. \$0, honest!

Knowledge / Technical Expertise: Basic Version: Middle school teachers use this with their students.

Data: Basic data for IN, IL, OH, MI, and WI is online – you can start with nothing. You can use your own data and customize the tool.

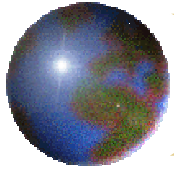


Important Questions

Staff: No commitment for user

Platform: Basic Version: Internet Access. You can run a GIS version if you like

Validity: Consistent with empirical data and other models. Accuracy increases with local calibration.

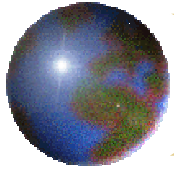


Important Questions

Transparency: If you've forgotten, it's explained at the web site

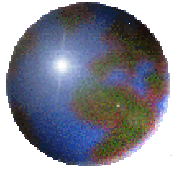
Understandability: Tool produces average annual runoff and pollutant loadings for each land use decision.

Scope: Can be used at site or broad scale, but should be used at the scale of the land use decision.



How is L-THIA Used?

- Near Columbus, OH – significance of urbanization on runoff and water quality
- Triangle Park, NC – comprehensive land use plan
- NASA KSC, FL – impacts of historical land use change
- Northeast OH – land use planning policy assessment
- Indianapolis, IN – historical impacts
- Kokomo, IN – TMDL development



Long-Term Hydrologic Impact Assessment (L-THIA) - Microsoft Internet Explorer provided by Purdue University

Address: <http://www.ecn.purdue.edu/runoff/>



Local Government Environmental Assistance Network

HOT TOPICS	WHAT'S NEW?	REGULATORY INFORMATION	TOOLS & RESOURCES	CALENDAR
------------	-------------	------------------------	-------------------	----------

Land Use Impacts on Water Quality

As local land use decisionmakers, municipal and county leaders regularly measure the benefits and costs of development proposals. In addition to factors such as the extension of existing infrastructure and the delivery of government services, local officials are beginning to consider the impact that land use changes will have on a community's water quality.

Land use changes can significantly impact groundwater recharge, stormwater drainage, and water pollution. The Long-Term Hydrologic Impact Assessment (L-THIA) model was developed as an accessible online tool to assess the water quality impacts of land use change. Based on community-specific climate data, L-THIA estimates changes in recharge, runoff, and nonpoint source pollution resulting from past or proposed development. As a quick and easy-to-use approach, L-THIA's results can be used to generate community awareness of potential long-term problems and to support planning aimed at minimizing disturbance of critical areas. L-THIA is an ideal tool to assist in the evaluation of potential effects of land use change and to identify the best location of a particular land use so as to have minimum impact on a community's natural environment.



Basic L-THIA **Impervious L-THIA** **GIS L-THIA**

Differences Between the Models

- Basic L-THIA**
Users only need to input their location, soil type, and the type of land use change taking place.

Changing Landscapes: Anticipating the effects of local land use decisions.

Long-Term Hydrological Impact Assessment (L-THIA)

<http://www.ecn.purdue.edu/runoff/lthianew>